

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS

1-2. (Canceled)

3. (Previously Presented): The processor of Claim 6, wherein said set of exception registers is for servicing exceptions having a high priority not for those exceptions having a low priority.

4. (Previously Presented): The processor of Claim 6, wherein said processor provides a dedicated vector to said set of exception registers for said exception.

5. (Previously Presented): The processor of Claim 6, wherein there are at least eight exception registers.

6. (Previously Presented): A processor comprising:

a set of general purpose registers; and

a set of dedicated exception registers that are switched for a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing exceptions;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls;

wherein at least one general purpose register that is not switched to service exceptions is configured to allow access by said processor during said servicing of an exception.

7. (Original): The processor of Claim 6, wherein said processor provides a first dedicated vector to software which uses said portion of said set of exception registers for interrupts and a second dedicated vector to software which uses said

another portion of said set of exception registers for servicing operating system calls.

8. (Previously Presented): The processor of Claim 6, further comprising:

a select logic circuit having a first input terminal that receives an exception register active bit and a second input terminal that receives a register address bit, said select logic circuit provides an output signal on an output terminal used to select between said set of general purpose registers and said exception registers.

9. (Canceled)

10. (Previously presented): The method of Claim 12, wherein said at least one set of exception registers is a dedicated set of exception registers.

11. (Currently Amended): A method of interrupting the execution of a task and servicing an exception in a processor, said method comprising:

swapping a set of general purpose registers for at least one set of exception registers if an exception asserted at said processor is a high priority exception;

servicing said exception using said at least one set of exception registers if said exception is a high priority exception;

preserving information from the set of general purpose registers in a memory if said exception is a low priority exception; and

swapping out said exception registers for said set of general purpose registers and resuming execution of said task if said exception is a high priority exception;

wherein servicing said exception using said at least one set of exception registers comprises modifying the values of the registers in said set of exception registers without disrupting the state of the interrupted task; and

wherein during servicing of an exception, a subset of said set of general purpose registers are not replaced with an alternate set and the subset of said set

of general purpose registers that are not replaced with an alternate set allow data sharing between exception processing and normal execution.

12. (Currently Amended): A method of interrupting the execution of a task and servicing an exception in a processor, said method comprising:

swapping a set of general purpose registers for at least one set of exception registers if an exception asserted at said processor is a high priority exception;

servicing said exception using said at least one set of exception registers if said exception is a high priority exception;

preserving information from the set of general purpose registers in a memory if said exception is a low priority exception; and

swapping out said exception registers for said set of general purpose registers and resuming execution of said task if said exception is a high priority exception;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls; and

wherein during servicing of an exception, a subset of said set of general purpose registers are not replaced with an alternate set and the subset of said set of general purpose registers that are not replaced with an alternate set allow data sharing between exception processing and normal execution.

13. (Previously Presented): The method of Claim 19, wherein said first vector is a dedicated vector and said providing said first vector automatically separates said high priority exception from said lower priority exceptions.

14. (Currently Amended): A method of interrupting the execution of a task and servicing an exception in a processor, said method comprising:

swapping a set of general purpose registers for at least one set of exception registers if an exception asserted at said processor is a high priority exception;

servicing said exception using said at least one set of exception registers if said exception is a high priority exception;

preserving information from the set of general purpose registers in a memory if said exception is a low priority exception; and

swapping out said exception registers for said set of general purpose registers and resuming execution of said task if said exception is a high priority exception;

wherein said exception is a high priority exception and is either an interrupt or an operating system call, said method further comprising:

providing a first vector and activating at least a portion of said exception registers for said high priority exception when said exception is an interrupt;

providing a second vector and activating at least another portion of said exception registers for said high priority exception when said exception is an operating system call; and

providing a third vector and not activating said set of exception registers for lower priority exceptions;

wherein during servicing of an exception, a subset of said set of general purpose registers are not replaced with an alternate set and the subset of said set of general purpose registers that are not replaced with an alternate set allow data sharing between exception processing and normal execution.

15. (Original): The method of Claim 14, wherein said first vector and said second vector are dedicated vectors and said providing said first vector and providing said second vector automatically separates said high priority exception from said lower priority exceptions.

16. (Canceled)

17. (Currently Amended): An apparatus for executing tasks and servicing exceptions, said apparatus comprising:

means for interrupting a task when an exception is asserted;
means for servicing said exception without disrupting the state of the interrupted task, including means for activating at least one set of dedicated exception registers; and
means for resuming execution of said interrupted task, including means for deactivating said dedicated exception registers and activating general purpose registers to resume execution of said task;
wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls; and
wherein during servicing of an exception, a subset of said set of general purpose registers are not replaced with an alternate set and the subset of said set of general purpose registers that are not replaced with an alternate set allow data sharing between exception processing and normal execution.

18. (Original): The apparatus of Claim 17, wherein said means for activating comprises a first select logic circuit coupled to said set of general purpose registers and a second select logic circuit coupled to said at least one set of exception registers, said second select logic circuit receives an execution register active bit enabling said at least one set of exception registers and said second select logic circuit receives an inverted execution register active bit disabling said set of general purpose registers.

19. (Previously presented): The method of Claim 12 wherein said servicing comprises providing a first vector and activating said at least one set of exception registers for said high priority exception, and wherein said providing comprises providing a second vector and not activating said set of exception registers for lower priority exceptions.

20. (Previously Presented): A processor comprising:

a set of general purpose registers; and
a set of dedicated exception registers that are switched for a subset of said set of general purpose registers only when an exception having at least a predetermined priority level is detected by said processor and that are not switched when an exception having a priority less than the predetermined priority level is detected by said processor;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls;

wherein at least one general purpose register that is not switched to service exceptions is configured to allow modification of the register states by said processor during said servicing of an exception.

21. (Previously presented): The processor of Claim 20 further comprising another set of dedicated exception registers that are switched for at least a subset of said set of general purpose registers only when another exception having at least said predetermined priority level is detected by the processor while said set of dedicated exception registers are switched for at least the subset of said set of general purpose registers.

22. (Previously presented): The processor of Claim 20 further comprising a select logic circuit having a first input that receives an exception register active bit and a second input that receives a register address bit, said select logic circuit provides an output signal on an output used to select between said set of general purpose registers and said exception registers.

23. (Previously Presented): A processor comprising:

a set of general purpose registers; and
a set of dedicated exception registers that are switched for a subset of said set of general purpose registers only when an exception having at least a

predetermined priority level is detected by said processor and that are not switched when an exception having a priority less than the predetermined priority level is detected by said processor;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls;

wherein at least one general purpose register that is not switched to service exceptions is configured to allow access by said processor during said servicing of an exception such that said processor can modify register states of said at least one general purpose register.

24. (Previously presented): The processor of Claim 20 wherein said set of dedicated exception registers is switched only when an exception, of a first type, having at least a predetermined priority level is detected by said processor and the processor further comprising another set of dedicated exception registers that are switched for at least a subset of said set of general purpose registers only when another exception, of a second type, having at least said predetermined priority level is detected by the processor.

25. (Previously presented): The method of Claim 12, wherein servicing said exception using said at least one set of exception registers comprises modifying the values of the registers in said set of exception registers without disrupting the state of the interrupted task.

26. (Previously presented): The method of Claim 12, wherein said exception is a high priority exception and is either an interrupt or an operating system call, said method further comprising:

providing a first vector and activating at least a portion of said exception registers for said high priority exception when said exception is an interrupt;

providing a second vector and activating at least another portion of said exception registers for said high priority exception when said exception is an operating system call; and

providing a third vector and not activating said set of exception registers for lower priority exceptions.

27. (Previously Presented): A processor comprising:

a set of general purpose registers; and

a set of dedicated exception registers that are switched for a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing at least a subset of exceptions;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls;

wherein at least one general purpose register that is not switched to service exceptions is configured to be read and written directly by said processor during said servicing of an exception.

28. (Currently Amended): A processor comprising:

a set of general purpose registers; and

a set of dedicated exception registers that are switched for a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing at least a subset of exceptions;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls; and

wherein during servicing of an exception, a subset of said set of general purpose registers are not replaced with an alternate set and the subset of said set

of general purpose registers that are not replaced with an alternate set allow data sharing between exception processing and normal execution.

29. (Previously Presented): A processor comprising:

 a set of general purpose registers; and

 a set of dedicated exception registers that are switched for a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing at least a subset of exceptions;

 wherein a portion of said set of exception registers is for servicing exceptions and another portion of said set of exception registers is for servicing operating system state and information calls;

wherein at least one general purpose register that is not switched to service exceptions is configured to be read and written directly by said processor during said servicing of an exception.

30. (Previously presented): The processor of claim 29 wherein the portion of said set of exception registers for servicing exceptions is adapted to servicing interrupts.

31. (Currently Amended): A processor comprising:

 a set of general purpose registers; and

 a set of dedicated exception registers that are switched for a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing at least a subset of exceptions;

 wherein a portion of said set of exception registers is for servicing exceptions and another portion of said set of exception registers is for servicing operating system state and information calls; and

wherein during servicing of an exception, a subset of said set of general purpose registers are not replaced with an alternate set and the subset of said set of general purpose registers that are not replaced with an alternate set allow data sharing between exception processing and normal execution.

32. (Previously presented): The processor of claim 31 wherein the portion of said set of exception registers for servicing exceptions is adapted to servicing interrupts.

33. (New): A processor comprising:

a set of general purpose registers; and

a set of dedicated exception registers that are switched for a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing exceptions;

wherein a portion of said set of exception registers is for servicing interrupts and another portion of said set of exception registers is for servicing operating system calls; and

wherein at least one general purpose register that is not switched to service exceptions is configured to be read and written directly by said processor during said servicing of an exception.